June 9, 2003

TO: Internal File

THRU: Stephen J. Demczak, Environmental Scientist III/Engineering, Team Lead

FROM: Jerriann Ernstsen, Ph.D., Environmental Scientist/Biology

RE: Boundary Modification (Abatement to N03-39-1-1), Consolidation Coal Company, Emery Deep Mine, C/015/015-03B

SUMMARY:

The Division approved the construction of the 4th East Portal area in 1990. The Permittee amended the plan to include 1.45-acre boundary modification. The modification plan is in response to the Notice of Violation (February 20, 2003) to keep coal fines within disturbed area. This memo reviews the information submitted with the modification dated April 9, 2003.

It is critical for the Division to adequately determine whether abatement measures are effective. Some type of measuring system should be installed to track coal fines. The system should include installation of air quality equipment/instrumentation to measure changes in the amount of fugitive dust that leaves the permit area. The Division should consult with the Division of Air Quality and other agencies to determine the most effective method for data collection and analysis.

The Permittee agreed to follow a four-phase evaluation of revegetation plans. The Division may require innovative revegetation procedures and additional materials based on the results of the four-step phase project.

The Permittee implemented many of the mitigation measures listed in this amendment. Implementation came before the Division reviewed the amendment.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Analysis:

Montgomery Archeological Consultants surveyed 40 acres of the Emery Mine including the 4th east portal as well as powerline corridor in 2002. The same firm surveyed the 1.45 acre expansion area in March 2003. The 2003 Montgomery results show a site east of the Emery permit boundary. The site number is 42EM2961 and consists of lithic debitage and tools of rock and stone (survey, pg. 6). This site is considered eligible to the NRHP (survey, pg. 7). Emery Mine installed a fence alone the site boundary to help protect the site. The consultants determined that with the installation of the fence, there is "No Historic Properties Affected". In accordance to R645-301-411.142, the Division will seek to obtain clearance by SHPO (State Historic Preservation Officer) for site.

It is not clear whether the consultants revisited the site following installation of the protective fence. The Division will visit the site to evaluate the level of protection the fence may provide from vandilizm. The historic site is near two county roads and may be easily seen. The area of impact caused by coal fines possibly includes this historic site. The Division will also evaluate possible impacts to the site caused by fugitive coal fines.

The Permittee discusses that a part of the Emery mine permit area was placed under the National Trails System in 2002. The amendment refers to Plate X-A-1 to see this designated trail. The map provides a narrative piece discussing this trail.

Findings

Information provided in the application is considered adequate to meet the minimum Historic and Archeological Resource Information of the Environmental Resource Information requirements.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

The soil map in Chapter VII needs clarification. There are two notations for light purple: "B#" and "Be#". The Permittee must either assign a separate color code for one of the two notations or edit the map to show a single notation (R645-301-121.200).

Findings:

Information provided in the application is not considered adequate to meet the minimum Map Resource Information of the Environmental Resource Information requirements. Prior to approval, the Permittee must act in accordance with the following:

R645-301-121.200, Either assign a separate color code for one of the two notations or edit the map to show a single notation (soil map; Chapter VII).

OPERATION PLAN

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and Enhancement Plan

The prevailing winds at the Emery mine are westerly, therefore, coal fines blow from the coal pile to the east including this 1.45 acres. The Permittee installed a weather station in January 2003 and is currently collecting data. This data should help verify the prevailing wind direction and speed as well as provide diurnal and season wind patterns.

The Permittee is requesting an enlargement of the disturbed area to include an additional 1.45 acres directly to the east of the loadout operation pad. Coal fines blow from the coal pile to this 1.45 acre and beyond. The depth of the coal fines has increased since the NOV was written in January (visual observation). As the coal pile increases, the quantity of coal fines blown to the east will increase.

The measures that the Permittee proposes to reduce coal fines from leaving the permit area are not adequate. At this time, the Permittee has already implemented a few of the abatement measures listed in this amendment. If these measures are reducing the amount of coal fines, the actual amount of reduction is not quantifiable or observable at this time. The amount of coal fines on May 8th 2003 was over 2" in certain points within the 1.45-acre area (Division field visit). This amount is significantly greater than the amount approximated during the January 2003 field visit. Because the mine does not have a program to measure coal fines blown from the stockpile, the amount of coal deposited following abatement installation is unknown.

It is critical for the Division to adequately determine whether abatement measures are effective for the protection of vegetation and wildlife. Some type of measuring system should be installed to track coal fines. The system should include installation of air quality instrumentation/instrumentation to measure changes in the amount of fugitive dust that leaves the permit area. The Division should consult with the Division of Air Quality and other agencies to determine the most effective method for data collection and analysis.

One of the abatement measures implemented, to date, includes spraying water onto the coal on the conveyor system. The Permittee must submit a water spray plan that includes the following: (R645-301-333)

- Rate and duration of water application.
  - Consider changes in weather.
  - Consider coal fine size and amount.
- Volume of water per spray event.
- Size of spray nozzle (volume of water must be within the spec of the nozzle).
- Plan for nozzle maintenance. Consider wintertime matters.
  - Steps to take to prevent water line freezing.
  - Steps to take when lines freeze.

If the rate or volume of water applied is not adequate, then success of abatement is limited. The water applied to the coal currently comes from the mine and is considered high in precipitates. If the spray nozzles are not properly maintained, the water will plug the nozzles.

The Air Quality chapter includes a section "Protection of Surrounding Environment". It is unclear how increasing the mine disturbance area by 1.45 acres as well as increasing the mine permit boundary east of the county road is "protecting" the environment. It seems that increasing the disturbance area by 1.45 acres may entail the removal of the topsoil and native vegetation and animal life. This removal certainly will not protect the environment, as it existed prior to removal. If the Permittee does not implement a more rigorous abatement program, then the area to the east where coal fines currently blow will increase the impact to soil parameters, vegetation, and wildlife. The Permittee must submit a plan that describes additional measures to prevent coal fines from blowing off the coal stockpile. These measures must include using the best technology available, such as installation of a silo (R645-301-358) or could include moving the conveyor system within the hole east of the 4th east portal. The Permittee must also submit a plan that address how the Permittee will prevent additional disturbance from coal fines to soil, vegetation, and wildlife in the area east of the coal stockpile (R645-301-333).

Findings:

Information provided in the application is not considered adequate to meet the minimum Fish and Wildlife Information requirements of the Operations Plan regulations. Prior to approval, the Permittee must act in accordance with the following:

R645-301-333, **(1)** Submit a water spray plan that will help maximize the effectiveness of the spray system. **(2)** Submit a plan that address how the Permittee will prevent additional disturbance from coal fines to soil, vegetation, and wildlife in the area east of the coal stockpile.

R645-301-358, Submit a plan that describes additional measures to prevent coal fines from blowing off the coal stockpile. These measures must include using the best technology available, such as installation of a silo or could include moving the conveyor system within the hole east of the 4th east portal.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Analysis:

The Division requires that the Permittee retain the integrity of the eastern portion of the southern perimeter berm of the topsoil stockpile. The Permittee seeded this eastern portion of the berm in 2002 with a "warm" season seed mix. Although the seed mix is not entirely composed of warm season plant species, continued monitoring of this trial mix is still considered valid for the Emery mine reclaimability study (R645-301-341.300).

The amendment describes cool and warm season interim seed mixes. The two seed mixes contain neither entirely cool nor warm season species, but contain a combination of warm and cool season species. The Permittee must change all references to warm and cool season seed mixes, in the MRP, to reflect the actual type of the seed mix (R645-301-121.200). The Division suggests replacing the name "warm" and "cool" season interim seed mixes with native and non-native interim seed mixes, respectively. Note that the native interim seed mix contains a high diversity of plant species, whereas the non-native mix contains a relatively low diversity of species.

This memo will refer to these two seed mixes as Native (warm) and Non-native (cool) mixes from this point forward.

The Permittee stabilized the topsoil stockpile at the 4th East Portal by gouging the top and sides of the topsoil stockpile, hydroseeding, and mulching (Ch. IV, p. 7a). The Permittee hydroseeded the top and sides of the topsoil stockpile with the non-native interim seed mix, while traditional broadcast seeding 1/3 of the southern berms with the native interim seed mix. The two seed mixes are neither entirely cool nor warm season species, but both mixes are a combination of warm and cool season species. The following table shows the species used for both mixes and provides the photosynthetic pathway used by these species.

NATIVE - INTERIM MIX ("WARM SEASON")	**ACTUAL PHOTOSYNTHETIC PATHWAY** **COOL = C3 PATH WARM = C4 PATH**
Shadscale	Cool
Fourwing saltbush	Warm
Castle valley clover	Unknown at this time
Streambank wheatgrass	Cool
Scarlet globe mallow	Cool
Winterfat	Cool
Blue grama	Warm
Indian rice grass	Cool
Alkali sacaton	Warm
NON-NATIVE - INTERIM MIX ("COOL SEASON")	
Crested wheatgrass	Cool
Fourwing saltbush	Warm
Russian wildrye	Cool

The Permittee agreed to follow a four-phase evaluation of revegetation plans. In phase I, the Permittee will investigate and summarize past reclamation sites and practices at the Emery Deep and Hidden Valley Mines. In phase II, based on those investigations, and in consultation with the Division, the permittee will implement the best techniques demonstrated to be successful. In phase III, the applied techniques will be evaluated qualitatively annually and quantitatively between the 4th and 6th year. These evaluations will be correlated to the precipitation data results obtained from an on-site weather station and incorporated into the annual report. Results of the phase III evaluations may result in additional field trials. The Permittee agreed to submit a full scope of work for this study by the end of March 2003 (Chapter III, Page 4b).

The Permittee must consult with the Division to determine which interim seed mix to use on all relocated topsoil prior to seeding (R645-301-341.210). This requirement is partially based on the unresolved issue concerning the final location of topsoil. If the Permittee relocates the topsoil to form a new topsoil pile, then the Division recommends using the native interim mix ("warm" season). This new stockpile would serve as a study of reclaimability for Emery. If the Permittee relocates the topsoil to berms surrounding the existing topsoil stockpile (as written in this amendment), then the Division recommends using the non-native interim mix ("cool" season).

Findings:

Information provided in the application is not considered adequate to meet the minimum Vegetation requirements of the Operations Plan regulations. Prior to approval, the Permittee must act in accordance with the following:

R645-301-121.200, Clarify the references to warm and cool season seed mixes to reflect the actual type of the seed mix.

R645-301-341.300, Retain the integrity of the eastern portion of the southern perimeter berm of the topsoil stockpile in order to maintain monitoring of the native seed mix (warm season).

R645-301-341.210, Consult with the Division to determine which interim seed mix to use on all relocated topsoil prior to seeding.

RECLAMATION PLAN

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

Chapter three discusses biological crusts as part of the reclamation procedures. It is unclear whether the Permittee is going to implement a proactive cryptogams replacement program. The following is also unclear:

- Where the Permittee will harvest the cryptogams?
- What extraction and reapplication protocols the Permittee will follow?
- Why relocation to gouge interior edges provides maximum effect?

In order to obtain maximum benefit from cryptogams replacement, the Permittee must provide a clear, decisive, and technologically advanced plan for the cryptogam soil amendment (R645-301-243; R645-301-121.200).

Findings:

Information provided in the application is not considered adequate to meet the minimum Stabilization of Surface Areas requirements of the Reclamation Plan regulations. Prior to approval, the Permittee must act in accordance with the following:

R645-301-121.200, Provide a clear, decisive, and technologically advanced plan for the cryptogam soil amendment.

VEGETATION

Regulatory Reference: 30 CFR 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General Requirements

Vegetation reference areas were established and quantitatively sampled in 1980 by Stoecher-Keammerer & Associates of Boulder, Colorado. The mixed desert shrub reference area had a vegetative cover of 10.6 percent (Ch. VIII, pg. 19). The raw data is not included in the Mining and Reclamation Plan (MRP). Eleven percent vegetative cover is low from the Division experience in observing vegetative cover on other adjacent sites. However, the reference area and 4th East Portal disturbed area compare equally based on the Division's visual observations. The vegetative cover of the reference area will be re-measured at the same time as the reclaimed disturbed area by the same observer according to the revegetation guidelines.

The MRP discusses standard revegetation methods to be used at final reclamation. In 20 years, Emery Deep Mine has not stabilized any disturbance on the permit area with vegetation after disturbance. Because of this problem, the Permittee committed to conducting studies of past and future reclamation as described in the Operation Plan, Vegetation section of this technical analysis and as described in Chapter III, Page 4b of the MRP. Demonstrating that the site can be reclaimed is important to obtaining future approval for site disturbance. Transplants, irrigation and/or amendments may be required to establish vegetation. Repeated and continuous efforts at the Hidden Valley Mine and Emery Deep Mine must be made to establish vegetation. The Division may require innovative revegetation procedures and additional materials based on the results of the four-step phase project.

Findings:

Information provided in the application is considered adequate to meet the minimum Revegetation requirements of the Reclamation Plan regulations.

RECOMMENDATIONS:

Do not approve the application until all deficiencies have been addressed.